

**CLAIMS**

What is claimed is:

- 5     1. A device providing Automatic Protection Switching (APS) functionality in an Ethernet environment, comprising:
  - an Ethernet APS Bridge Selector for implementing APS; and
  - an Ethernet APS Bridge Selector Sublayer for managing the Ethernet APS Bridge Selector;
- 10         wherein the Ethernet APS Bridge Selector interconnects Media Access Control (MAC) hardware and a plurality of Physical Layer (PHY) hardware devices.
- 15     2. The device of claim 1, wherein the MAC interfaces with the Ethernet APS Bridge Selector.
3. The device of claim 1, wherein the Ethernet APS Bridge Selector interfaces with the plurality of PHY hardware devices.
- 20     4. The device of claim 1, wherein the Ethernet APS Bridge Selector enables Standard SDH/SONET APS functionality in an Ethernet Architecture.
5. The device of claim 1, wherein the Ethernet APS Bridge Selector comprises one of a bridge and a selector.
- 25     6. The device of claim 1, wherein the Ethernet APS Bridge Selector comprises at least one of a bridge and a selector.
7. The device of claim 1, wherein the Ethernet APS Bridge Selector executes bridging operations.
- 30     8. The device of claim 1, wherein the Ethernet APS Bridge Selector executes selector operations.

9. The device of claim 1, wherein the Ethernet APS Bridge Selector executes switching operations.
10. The device of claim 1, wherein the Ethernet APS Bridge Selector enables drop and  
5 continue functionality.
11. The device of claim 1, wherein the Ethernet APS Bridge Selector enables pass through functionality.
- 10 12. The device of claim 1, wherein the Ethernet APS Bridge Selector interfaces with a MAC using RS interface primitives.
13. The device of claim 1, wherein the Bridge Selector Sublayer interface comprises a PHY interface in the form of one of XGMII, GMII, and MII.  
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14. The device of claim 1, wherein the Bridge Selector Sublayer interface comprises an Attachment Unit Interface (AUI) in the form of XAUI.
15. The device of claim 1, wherein the Ethernet APS Bridge Selector interfaces the  
20 PHY using a MAC to PHY interconnect interface.
16. The device of claim 1, wherein the Ethernet APS Bridge Selector bridges between the plurality of PHY hardware devices.
- 25 17. The device of claim 1, wherein the Ethernet APS Bridge Selector selects between the plurality of PHY hardware devices.
18. The device of claim 1, wherein the Ethernet APS Bridge Selector switches between the plurality of PHY hardware devices.  
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19. The device of claim 1, wherein the Ethernet APS Bridge Selector provides switchover within 50 ms for recovery and protection functionality.

20. The device of claim 1, wherein the Ethernet APS Bridge Selector provides a PLS interface to control APS functionality.
21. The device of claim 1, wherein the Ethernet APS Bridge Selector provides signals in the form of one of XGMII and XAUI, to control APS functionality.
22. The device of claim 1, wherein the Ethernet APS Bridge Selector provides control/register interfaces to control APS functionality.
23. The device of claim 1, wherein the Ethernet APS Bridge Selector is one of unidirectional and bidirectional.
24. The device of claim 1, wherein the Ethernet APS Bridge Selector is utilized in at least one of nested and non-nested combinations.
25. The device of claim 1, further comprising a plurality of MAC sublayers that control the Ethernet APS Bridge Selector.
26. The device of claim 1, wherein the Ethernet APS Bridge Selector is controlled by a MAC Client in the form of at least one of APS and OAMP.
27. The device of claim 1, wherein the Ethernet APS Bridge Selector is controlled by software in the form of at least one of APS Controller software and OAMP software.
28. The device of claim 1, further comprising hardware implementing a plurality of Ethernet APS Bridge Selector devices.
29. The device of claim 1, wherein the Ethernet APS Bridge Selector devices are implemented in at least one of a MAC, XGXS, XAUI, and PHY hardware device.
30. A method of providing APS functionality on a MAC hardware device and a plurality of PHY hardware devices, comprising:  
    providing a Bridge Selector APS sublayer;

configuring the Bridge Selector APS sublayer in a bridge mode; and  
bridging a MAC hardware device to a plurality of PHY hardware devices;  
wherein the Bridge Selector APS sublayer interfaces to MAC transmit signals  
and bridges signals to a plurality of PHY transmit signals.

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31. The method of claim 30, wherein the Bridge Selector APS Sublayer interface  
comprises an RS interface in the form of PLS.

32. The method of claim 30, wherein the Bridge Selector APS Sublayer interface  
10 comprises an MII interface in the form of at least one of XGMII, GMII, and MII.

33. The method of claim 30, wherein the Bridge Selector APS Sublayer interface  
comprises an AUI in the form of XAUI.

15 34. The method of claim 30, wherein the Bridge Selector APS sublayer comprises a  
bridge configured to be in pass through mode wherein an input interface passes through  
to an output interface.

35. A method of providing APS functionality on a MAC hardware device and a  
20 plurality of PHY hardware devices, comprising:  
    configuring a Bridge Selector APS Sublayer in selector mode;  
    the Bridge Selector APS Sublayer selecting from the plurality of PHY hardware  
devices for connection to the MAC hardware device;  
    the Bridge Selector APS Sublayer interfacing to a plurality of PHY receive  
25 signals and selecting signals to MAC receive signals; and  
    switching over from an active channel to one of a standby channel and a  
specified channel when requested.

36. The method of claim 35, wherein the Bridge Selector APS Sublayer interface  
30 comprises an RS interface in the form of PLS.

37. The method of claim 35, wherein the Bridge Selector APS Sublayer interface  
comprises an MII interface in the form of at least one of XGMII, GMII, and MII.

38. The method of claim 35, wherein the Bridge Selector APS Sublayer interface comprises an AUI in the form of XAUI.
- 5 39. The method of claim 35, wherein the Bridge Selector APS Sublayer comprises a bridge configured to be in pass through mode, wherein an input interface passes through to output interfaces.
40. The method of claim 35, wherein the step of switching over executes within 50 ms  
10 to provide recovery functionality on an Ethernet protocol network.
41. A method of providing APS functionality on an Ethernet protocol network, comprising the steps of:  
    configuring a Bridge Selector in bridge mode; and  
15      bridging transmit traffic to working and protect channels.
42. A method of providing APS functionality on an Ethernet protocol network, comprising the steps of:  
    configuring a Bridge Selector in selector mode;  
20      selecting receive traffic from at least one of working and protect channels; and  
    switching from an active channel to one of a standby channel and a specified channel when requested.
43. The method of claim 42, wherein the method executes within 50 ms to provide  
25 recovery functionality.
44. A method of providing APS functionality on an Ethernet protocol network comprising the steps of:  
    one of bridging and selecting between a MAC hardware device and a plurality of  
30      PHY hardware devices; and  
    switching over from an active channel to one of a standby channel and a specified channel when requested.

45. The method of claim 44, wherein the method enables standard SDH/SONET APS functionality for linear, ring, and mesh topologies for Ethernet protocol networks using signal and control/register interfaces.
- 5    46. The method of claim 44, wherein the method executes within 50 ms to provide recovery functionality.